DOCUMENT RESUME

ED 252 243 IR 050 985

AUTHOR Sanchez, James Joseph
TITLE Increasing Special Library Collection Use in Very Computer Intensive Environments: Automatic Bibliographic Compilation and the Dissemination of Electronic Newsletters.
PUB DATE Nov 83
NOTE 37p.
PUB TYPE Computer Programs (101) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Cataloging; Computer Software; Information Dissemination; *Library Automation; Library Collections; Library Technical Processes; Newsletters; *Special Libraries
IDENTIFIERS *Electronic Publishing; *Scientific and Technical Information

ABSTRACT

This paper describes the development and implementation of an automatic bibliographic facility and an electronic newsletter created for a special collection of aerospace and mechanical engineering monographs and articles at the University of Arizona. The project included the development of an online catalog, increasing the depth of bibliographic description, providing the beginnings of a comprehensive citation index for selected subjects, and developing an automatic bibliographic facility and local area electronic newsletter. Appendices, which make up the major part of the report, comprise: (1) the full code listing for the search program, written in FORTRAN 4, which demonstrates the relative simplicity of the facility for developing bibliographies; (2) the help note written to aid the user in implementing a search; and (3) the full text of an electronic newsletter (the IGEL Bibliographer) developed to make all bibliographic searches available within the interested group. The sample newsletter includes short bibliographies on eigenvalues, geometric nonlinearities, and composites. A source code listing of a single descriptor search facility is included as an addendum. (THC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED252243

Increasing special library collection use in very computer intensive environments: Automatic bibliographic compilation and the dissemination of electronic newsletters.

A brief description of the development and implementation of a automatic bibliographic facility and electronic newsletter for an aerospace and mechanical engineering special library: including full source code listings for the search facility, help note and sample newsletter.

The sample newsletter includes short bibliographies on eigenvalues, geometric nonlinearities and composites.

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

James Joseph Sanchez
November 1983

My work in the Aerospace and Mechnical Engineering Dept. of the University of Arizona was supported by Dean Richard Gallagher and Dr. Hussein A. Kamel. I would like to thank them here for that support.

IR050985

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

James Joseph Sanchez

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Increasing special library collection use in very computer intensive environments: Automatic bibliographic compilation and the dissemination of electronic newsletters

---

Table of contents

Text	1
Appendix One: Source Code Listing	5
Appendix Two: Help Note Listing	14
Appendix Three: IGEL BIBLIOGRAPHER newsletter	18
Addendum: Source code listing of single descriptor search facility	32

Bibliographies included in the newsletter

Eigenvalues bibliography	19
Geometric nonlinearities bibliography	22
Composites bibliography	24

Increasing special library collection use in very computer intensive environments: Automatic bibliography compilation and the dissemination of electronic newsletters.

This paper is the description of the facilities developed by the author to assist users of a special collection holding of aerospace and mechanical engineering monographs and articles at the University of Arizona.

In the process of developing an online catalog for the collection, I was frequently surprized by the degree to which users of the modest collection were unable to make full use of the holdings. Most users (graduate students), even working in very narrow areas, simply did not know what the library held. While the first step towards making its resources more available was the development of an online catalog (supported by the department's Data General MV10000 minicomputer), it became clear to me that this was only the first step.

Subsequently, my work included increasing the depth of bibliographic description (such as entering every paper included in conference proceedings), providing the beginnings of a comprehensive citation index for selected subjects (here finite elements and array processors), and especially, the development of an automatic biblio-

graphic facility and a local area electronic newsletter.

This very brief paper will consider these last two steps in some detail (especially in the attached appendices). One reason for linking these two projects so closely is that each reinforced the other so well. The bibliographic product of the search facility would be disseminated in the newsletter and the newsletter would prompt requests for more bibliographies.

Appendix one includes the full code listing for the search program. The program is written in FORTRAN 4, which of course means that it is already becoming somewhat dated. However, the full code listing does demonstrate the relative simplicity of the facility for developing the bibliographies. The program includes the capability to base a search on logical relations between search terms, here: and, or, not.

Appendix two is the help note written to aid the user in implementing a search. The help note was specifically written to lead people through the process step by step. While there was resistence to the verbose length of the help note, I did write it to be clear in English, with something of a forlorn hope that it would provide a new standard there of clear text documentation for the system's facilities.

As can be seen, one consideration built into the search facility's help note is the final disposition of the bibliographies so generated. As I always argued upon individiual users, the users of the collection always profited by keeping up on each others bibliographic research. By providing both machine readable files and hardcopy output, the searches of each was of value to all. Similarly, each machine readable file could be the basis of further, more detailed, searches.

The third appendix is the logical culmination of this concept of dissemination. The third appendix includes the full text of the newsletter developed to make all such searches "universally available", at least within the interested group. Each of the three bibliographies included was the product of a special request. In the IGEL Lab environment, each newsletter was available in both hardcopy and electronic versions.

This brief presentation of the search facility and its dissemination describe a method for greatly increasing collection usage. The "software" requirements were very modest and inclusion of the complete code listing here is intended to help make the system transportable. The system here is of course more suited to small holdings than large (because the search system was, in practice,

rather slow). This is, however, not a major problem for small (under 10000) special collections and personal indexed collections. It is hoped that this description will make this type of systems enhancement just a little easier to implement in small collections.

Appendix One: Source code listing.

```
      logical ieof,qeval
      integer ifile(16),ofile(16)
      integer str(60),linbuf(40,60),line(40)
      integer biga,smalla,smallz
      data biga,smalla,smallz/"<000>A","<000>a","<000>z"/

      write (10,10002)
10002 format ("Output file: ",Z)
      read (11,11001) ofile(1)
      open 6,ofile,att="SO"

      write (10,10003)
10003 format ("Search string: ",Z)
      read (11,11002) str(1)
      len = length(str)
      do 3 i=1,len
       byte(str,i) = iand(byte(str,i),127)
       if (byte(str,i) .ge. smalla .and. byte(str,i) .le. smallz)
     +       byte(str,i) = byte(str,i) - smalla + biga
3     continue

      write (6,6001) str(1)
6001  format ("I.G.F.L.  Library"//
     +        "Select bibliography on"/,S79/
     +        79(1H-)/)

5     write (10,10001)
10001 format ("Input file:  ",Z)
      read (11,11001,end=9999) ifile(1)
11001 format (S31)
      if (byte(ifile,1) .eq. 0) goto 9999
      open 5,ifile,att="SIB",err=5

      write (10,10006)
10006 format ("Enter subheading (RETURN if none): ",Z)
      read (11,11002) line(1)
11002 format (S79)
      if (byte(line,1) .ne. 0) write(6,6002) line(1)
6002  format (/S79/79(1H-)/)

      imatch = 0
      read (5,5001) line
5001  format (40A2)

      ieof = .false.
10    iptr = 1
15    call strcpy(line,1,linbuf(1,iptr),1,80,.false.,.false.)
      read (5,5001,end=99) line
      if (byte(line,1) .ne. 32) goto 20
       iptr = iptr + 1
       goto 15

99    ieof = .true.
20    continue

      if (qeval(linbuf,iptr,str,1,len)) goto 70
      if (.not. ieof) goto 10
      goto 999

70    imatch = imatch + 1
      do 80 i=1,iptr
       write (6,5001) (linbuf(j,i),j=1,40)
80    continue
      if (.not. ieof) goto 10
```

BEST COPY

```
999     continue
        close 5
        write (10,10005) imatch
10005   format (I5," Entries matched ")
        goto 5

9999    end
```


BEST COPY

```
      integer function ichid(str,n)
      integer str(1),n
      integer lparen,rparen,minus,plus,and
      data lparen,rparen,minus,plus,and/
     + "<000>(","<000>)","<000>-","<000>+","<000>&"/

      ichid = byte(str,n)
      if (ichid .eq. lparen) ichid = -1
      if (ichid .eq. rparen) ichid = -2
      if (ichid .eq. minus ) ichid = -3
      if (ichid .eq. plus  ) ichid = -4
      if (ichid .eq. and   ) ichid = -5

      return
      end
```

ICHID.FR

BEST COPY

f5id search strcpy length qeval qmatch1 ichid

LINK.CLI

BEST COPY

```
      integer function length(string)
      integer string(1)

      length = 0
10    if (byte(string,length+1) .eq. 0) return
       length = length+1
       goto 10

      end
```

LENGTH.FR

FTN V

BEST COPY

```
      logical function qeval(record,nlines,pattern,first,last)
      integer record(40,nlines),pattern(1)
      integer first,last
      logical qeval,qfirst,qsecond,qmatch1

      if (first .gt. last) stop "?Null expression"
      ichar = ichid (pattern,first)
      if (ichar .ge. 0) goto 10

      if (ichar .ne. -1) goto 20
       ilev = 1
       iptr = first+1
25     if (iptr .gt. last) stop "?Missing right parenthesis"
       ic2 = ichid(pattern,iptr)
       if (ic2 .eq. -1) ilev = ilev + 1
       if (ic2 .eq. -2) ilev = ilev -1
       if (ilev .eq. 0) goto 27
       iptr = iptr + 1
       goto 25
27     qfirst = qeval (record,nlines,pattern,first+1,iptr-1)
      iptr = iptr + 1
       goto 40

20    if (ichar .ne. -3) goto 30
       qeval = .not. qeval (record,nlines,pattern,first+1,last)
       return

30    stop "?Misplaced operator"

10    iptr = first+1
15    if (iptr .gt. last) goto 17
      ic2 = ichid(pattern,iptr)
      if (ic2 .lt. 0) goto 17
      iptr = iptr + 1
      goto 15

17    qfirst = qmatch1(pattern,first,iptr-1,record,nlines)

40    continue
      if (iptr .ge. last) goto 50
       ic2 = ichid (pattern,iptr)
       if (ic2 .gt. -3) stop "?Misplaced or missing operator"
       qsecond = qeval (record,nlines,pattern,iptr+1,last)
       if (ic2 .eq. -3) qeval = qfirst .and. (.not. qsecond)
       if (ic2 .eq. -4) qeval = qfirst .or. qsecond
       if (ic2 .eq. -5) qeval = qfirst .and. qsecond
       return

50    if (iptr .eq. last) stop "?Missing operand"
      qeval = qfirst
      return

      end
```

QEVAL.FR

BEST COPY

```
      logical function qmatch1(str,first,last,linbuf,nlines)
      integer str(1),linbuf(40,nlines)
      integer first,last

      integer biga,smalla,smallz
      data biga,smalla,smallz/"<000>A","<000>a","<000>z"/

      do 40 i=1,nlines
       ilast = 80-(last-first)
       do 50 j=1,ilast
        do 60 k=1,last-first+1
         ic = iand(byte(linbuf(1,i),j+k-1),127)
         if (ic .ge. smalla .and. ic .le. smallz) ic = ic - smalla + biga
         if (ic .ne. byte(str,k+first-1)) goto 50
60      continue
        goto 70
50     continue
40    continue
      qmatch1 = .false.
      return

70    qmatch1 = .true.
      return

      end
```

QMATCH1.FR

BEST COPY

```
      subroutine STRCPY (source,s1,dest,d1,max,nullstop,addnull)
      integer source(1),s1,dest(1),d1,max
      logical nullstop,addnull
C
C     copies a string starting at the s1'th byte of source into the
C     d1'th byte of dest.  max chars are copied unless nullstop is
C     .true., in which case only chars preceeding the first null in
C     source are copied, up to max chars.  After the string is copied,
C     a trailing null is added if addnull is .true.
C
      iptrs = s1
      iptrd = d1
10    ichar = byte(source,iptrs)
      if (nullstop .and. ichar .eq. 0) goto 20
      if (iptrs-s1 .ge. max) goto 20
      byte (dest,iptrd) = ichar
      iptrs = iptrs + 1
      iptrd = iptrd + 1
      goto 10

20    if (addnull) byte (dest,iptrd) = 0
      return
      end
```

STRCPY.FR

BEST COP

Appendix two: Help note listing.

A facility for slow compilation of bibliographies from the databases that catalogue the IGEL Library.

PURPOSE: This program is intended as a tool for the prompt searching of the IGEL collection for any set of descriptors provided by you. The program will accept a string of descriptors and logical relationships between the descriptors so as to select citations for an output file. The output file created can be printed as a bibliography with subsets (e.g.: articles; monographs) as specified by the user and/or can be examined and edited. The purpose of this facility is to make every item in the IGEL Library available without lengthy manual searches.

EXECUTE: This program is easy to use and provides a series of queries, the responses to which will generate the desired output file. The output file can be printed as a bibliography or retained as a file if moved to the user's area

STEP 1: DIR LIBRARY
DIR SEARCH
X OBJECT:SEARCH

This step starts the execution of the program.

STEP 2 The response of the program is:

Output file

This provides for the naming of the output file. The filename must be legal. Of course, @output writes the sought citations on the screen as each is found, without the creation of an output file.

STEP 3 The response of the program to a correct filename is to write:

Search string

This is the point at which the user specifies the string of descriptors and logical relations that will select the citations written to the output file.

a) The alphanumeric string may contain letters, numbers and spaces. Truncation of a character string is readily available and useful (e.g.: search for terms without plural markers to pick up both singular and plural terms): truncation may be from either the right or left hand sides of a string. The program will match small or capital letters to both small and capital letters.

b) The use of more than one string as a descriptor does necessitate the use of logical notation. The three options available are:

i. & Ampersand specifies that the two strings so associated must both be present for the citation to be written to the output file.

BEST COPY

ii. + Plus specifies "or", that is if either of terms so associated is present, the citation will be written to the output file.

iii. - Minus specifies "not". This precludes the writing to an output file a citation that does includes one and/or more descriptors that are sought and one and/or more terms not sought.

c) In addition, descriptors can be grouped with ( ) parentheses. The strings grouped by the parentheses stand in the same relation to strings outside that set.

d) NOTE: The occurance of spaces in a string does cause that descriptor to require that space. Example:

SAMPLE STRING A. eigen -(1977+1978)
SAMPLE STRING B. eigen-(1977+1978)

The first string writes citations with "eigen" to the output file with the exception of citations that include the years 1977 or 1978 in the full description of the articles. However, the space following "eigen" will prevent the citation of "eigenvalue", "eigenfrequency", etc. This also illustrates the value of truncation. Do avoid spaces where spaces are not specifically needed

STEP 4 With the entry of the string(s) to be sought, the program prompts with:

Input file:

At this point the user may specify which files (databases) are to be searched. The files that are currently open to users are:

ARTICLES	use	^ARTICLES
BOOKS	use	^BOOKS

STEP 5 After the user specifies the input file to be searched for appropriate citations, the program prints:

Enter subheading (RETURN if none):

The intent of this is to allow the segmentation of the output file into several subsets. These subsets may be selected on the basis of format (e.g.: articles, books) of file searched or any other user determined segment.

STEP 6: At the completion of STEP 5, the program searches the file specified at STEP 3. The completion of the character by character searching through every record in that file will then loop the program back to STEP 3, allowing the user to specify an additional file to be searched. Default of return terminates the program's execution.

STEP 7: Output can be generated in two manners. Each requires that the output filename specified in STEP 2 be correctly

BEST COPY

a) TY filename	This command will print the contents of the output file on the screen.
b) QLPP filename	This command will produce a hardcopy of the output file.
c) @output	Recall that selection of this output option in STEP 2 writes citations directly to the screen WITHOUT the creation of an output file.

STEP 8: Do give some thought to the dissemination of the custom bibliography that has been prepared for you by this program. Also be aware that all of the files written by this program will be deleted every Monday afternoon by the IGEL Librarian: if you want to retain a copy of the output file, MOVE it to your area.

Any bibliographies created as a result of this facility should be filed in the IGEL Library so that it is not necessary for the same search to be run many times. Not only does this reduce the costs of this service, but it will save you time since the execution of this search program takes quite a long time.

Especially useful bibliographies will be reproduced and disseminated in the IGEL Library newsletter.

END OF HELP *BIBLIOGRAPHY

BEST COPY

Appendix three: IGEL BIBLIOGRAPHER newsletter.

```
IIIII  GGGGG  EEEEE  L
  I    G      E      L
  I    G  GG  EEEEE  L
  I    G   G  E      L
IIIII  GGGGG  EEEEE  LLLLL
```

BEST COPY

IGEL NEWSLETTER
PREPARED BY: J. SANCHEZ.

NUMBER TWO — IGEL BIBLIOGRAPHER — DATE: AUGUST 11, 1983

This second issue of the IGEL Library newsletter includes three of the new custom bibliographies generated by a short program written by Sam that searches the cumulative listing of articles and books in the IGEL Library. The first three products of this new program (a program which searches the full text of every entry) are listed on the following pages.

The first bibliography is one on "eigen". The use of this truncated descriptor includes: eigenproblems, eigenvalues, eigenpairs, eigenvectors, and eigenvalues.

The second bibliography concerns geometric nonlinearities. However, at the time that this program was written, there was not the facility in the program to be able to specify more than one word as a descriptor for the file to be created nor was there the facility to describe logical relations between descriptors. This oversight has now been corrected.

The second bibliography as a result is derived from the descriptor "geometric" and the result is rather mixed.

The third bibliography is one on the very broad topic "composites", although the exact descriptor used was "composite" so as to pick up a few extra citations.

```
EEEEE IIIII GGGGG EEEEE N   N
E       I   G     E     NN  N
EEEEE   I   G  GG EEEEE N N N
E       I   G   G E     N  NN
EEEEE IIIII GGGGG EEEEE N   N  THE EIGENVALUES BIBLIOGRAPHY
```

ARTICLES IN THE IGEL LIBRARY

Armand, J.-L., Lur'e, K.A., and Cherkaev, A.V. On the solution of eigenvalue optimization problems that arise in the design of elastic structures. Izv. AN SSSR Mekhanika Tverdogo Tela, Vol. 134, No. 5, pp. 159-162, 1978. Offprint. New York: Allerton Press, 1978.

Bampton, M.C.C., and Craig, R. Jr. The iterative solution of semidefinite eigenvalue problems. The Aeronautical Journal of the Royal Aeronautical Society, Vol. 75, April, 1971.

Bathe, Klaus-Jurgen. Solution methods for large generalized eigenvalue problems in structural engineering. Berkeley: University of California, 1971.

Bathe, Klaus-Jurgen, and Wilson, Edward L. Eigensolution of large structural systems with small bandwidth. Journal of Engineering Mechanics Division, June 1973.

Cook, Richard. Eigenvalue problems with a "mixed" plate element. AIAA Journal, Vol. 7, No. 5, May 1969.

Fox, R.L. amd Kapoor, M.P. A minimization method for the solution of the eigenproblem arising in structural dynamics. Cleveland, Ohio: Case Western Reserve University, [1968].

Fried, Isaac. Condensation of finite element eigenproblems. AIAA Journal, Vol. 10, No. 11, November 1972, pp. 1529-1530.

Geradin, M. Computational efficiency of equilibrium models in eigenvalue analysis. Paper presented at the IUTAM Colloquium on high speed computing of elastic structures, held in Liege, Belgium, August 1970.

Gupta, K.K. Eigenproblem solution by a combined strum sequence and inverse iteration technique. IJNME, Vol. 7, 1973, pp. 17-42.

Gupta, K.K. Solution of eigenvalue problems by strum sequence method. IJNME, Vol. 4, 1972, pp. 379-404.

Irons, Bruce M., and Treharne, Gabe. A found theorem in eigenvalues and its practical applications. Swansea: University of Wales, [no date].

Kamel, Hussein A., and Lambert, Russell L. Solution of structural eigenvalue problems using sparsely populated matrices. Paper presented at the Conference on computer oriented analysis of shell structures, held in Palo Alto, Calif., August 1970.

Lee, I.W., and Robinson, A.R. Solution technique for large eigenvalue problems in structural dynamics. Report UILU-ENG-79-2006. Urbana: University of Illinois, June 1979.

*ONR contract N00014-75-C-0164.

Malkus, D.S. Eigenvalues associated with the discrete lab condition for incompressible finite elements. International Journal of Engineering Science, Vol. 19, 1981, pp. 1299-1310.

Malkus, D.S. Incompressible finite elements: The LBB condition and the discrete eigenstructure. Chicago: Illinois Institute of Technology, [no date].

Patton, Peter C. A new numerical method for the simultaneous computation of the eigenvectors of arbitrary dynamical matrices. Stuttgart: Institut fur Statik und Dynamik der Luft- und Raumsfahrtkonstuktionen, Decmber 1966.

*translation of dissertation listed below as: Patton, Peter C. Die simultane berechnung von eigenvektoren und eigenwertspektren beliebiger dynamischer matrizen.

BEST COPY

Patton, Peter C. Die simultane berechnung von eigenvektoren und eigenwertspektren beliebiger dynamischer matrizen. [dissertation] Stuttgart: Technischen Hochschule Stuttgart, [July] 1966.

*German language text.

*English language translation listed above as: Patton, Peter C. A new numerical method for the simultaneous computation of the eigenvectors and eigenvalues of arbitrary dynamical matrices.

Patton, P.C. Some recently adapted computer algoritms for the calculation of eigenvalues of a matrix. Paper presented at the IUTAM Symposium on recent progress in the mechanics of linear vibrations, held in Paris, in April 1965.

*French language text.

Patton, P.C., and Bronlund, O.E. Eigenreduction of complex matrices by the A-P algorithm: A FORTRAN IV program. Stuttgart: Institut fur Statik und Dynamik der Luft- und Raumfahrtkonstuktionen, December 1966.

Robinson, Arthur, and Harris, John F. Improved approximate eigenvalues and eigenvectors. Journal of the Engineering Mechanics Division, Vol. EM-2, April 1971, pp. 457-475.

Stanton, Edward L., and McGovern, Dennis J. The application of gradient minimization methods and higher order discrete elements to shell buckling and vibration eigenproblems. Huntington Beach, Calif.: McDonnell Douglas Astronautics Company, Western Division, [no date].

Strigl, G. Die methode der transformierten randbedingungen zur berechnung von randwert- und eigenwertproblemen Der Stahlbau, Vol. 8, 1972, pp. 102-109.

*German language text.

Talaslidis, Demosthenes. Inkrementelle schalentheorien und numerische behandlung diskretisierter eigenwertprobleme der strukturmechanik auf der grundlage verallgemeinerter arbeitsaussagen. [disseration] Bochum: Ruhr-Universitat Bochum, 1978.

*German languae text.

Taylor, D.L., and Kane, T.R. Multiparameter quadratic eigenproblems. Reprint from the Journal for Applied Mechanics, Vol. 42, No. 2, June 1975, pp. 478-483.

Taylor, Dean Lee, and Kane, Thomas R. Quadratic eigenproblems. Stanford: Stanford University, Department of Applied Mechanics, August 1974.

*SUDAM Report 74-8.
*ONR contrcat N00014-67-A-0112-0065.

BEST COPY

Utku, Senol, and Melosh, Robert J. Behavior of triangular shell element stiffness matrices associated with polyhedral deflection distributions. Pasadena: California Institute of Technology, Jet Propulsion Laboratory, February 1968

*KW: eigenvalues.

Wanxie, Zhong, et al. JIGFEX and its application in large scale structural analysis. Dalian, PRC: Dalian Institute of Technology, [no date].

*KW: eigenvalue problems, FORTRAN.

Wright, G.C., and Miles, G.A. An economical method for determining the smallest eigenvalues of large linear systems. IJNME, Vol. 3, 1971, pp. 25-33.

END OF EIGENVALUES BIBLIOGRAPHY

```
GGGGG  EEEEE  OOOOO
G      E      O   O
G  GG  EEEEE  O   O
G   G  E      O   O
GGGGG  EEEEE  OOOOO   GEOMETRIC NONLINEARITIES BIBLIOGRAPHY
```

Adams, J. Alan. Geometric concepts for computer graphics. Engineering and weapons report EW-72-4. Annapolis, MD: United States Naval Academy, Division of Engineering and Weapons, September 1972.

Bathe, Klaus-Jurgen, Ozdemir and Wilson. Static and dynamic geometric and material nonlinear analysis. Berkeley: University of California, 1974.

*Report UC-SESM-74-4

Brink, Kurt, Kratzig, Wilfried B. Geometrically correct formulations fore curved finite bar elements under large deformations. [no publication data]

Clark, James A. Hierarchical geometric models for visible surface algorithms. Santa Cruz, Calif.: University of California, [1976].

Crisfield, M.A. Finite element analysis for combined material and geometric nonlinearities. Offprint. Crowthorne, Berkshire, England: Transport and Road Research Laboratory, [no date].

Cundall, peter A. Rational design of tunnel supports: A computer model for rock mass behavior using interactive graphics for the input and output of geometrical data. Omaha: US Army Corps of Engineers, September 1974.

Cundall, Peter, Voegele, Micheal, and Fairhurst, Charles. Computerized design of rock slopes using interactive graphics for the input and output of geometrical data. London: Dames & Moore, [no date].

*English language text, abstracts in English, French and German.

Dassler, R., et al. COMPAC--A system for computer aided handling of geometric data in design and manufacturing. Berlin: Technische Univerisiat Berlin, Institut fur Werkzeugmaschinen und Fertigungstechnik, [no date].

Durelli, A.J., Brown, K., and Yee P. Optimization of geometric discontinuities in stress fields. Rochester, Mich.: Oakland University, School of Engineering, March 1978.

*ONR contract N00014-76-C-0487.

Giese, John H., and Hartwig, George W. Jr. Geometrical experiments with a hidden line perspective program. RDT&E Project 1T161102A14B. Aberdeen, Maryland: Aberdeen Proving Ground, [no date].

Marcal, P.V. On general purpose programs for finite element analysis, with special reference to geometric and material nonlinearities. Report ARPA E-73. Providence, R.I.: Brown University, May 1970.

*ARPA contract SD-86.

McKee, James M., Golden, Micheal E, and Wallace, Dolores R. GPRIME: A geometric language for finite element modeling program manual. Bethesda, Md.: David Taylor Naval Ship Research and Development Center, September 1982.

*DTNSRDC-82-062.

Stricklin, James A. Geometrically nonlinear static and dynamic analysis of shells of revolution. Paper presented at the IUTAM Symposium on high speed computer of elastic structures, held in Liege, Belgium, in August 1970; College Station Texas: Texas A&M, August 1970.

Stricklin, James A. Survey of static geometric and material nonlinear analysis by the finite element method. Paper presented at the Second US-Japan Seminar on matrix methods in structural mechanics, held in berkeley, at the University of California, in August 1972.

Stricklin, James A., Haisler, Walter E., and Riesemann, Walter A. Von. Formulation, computation and solution procedures for materia, and/or geometric nonlinear structural analysis by the finite element method. Albuquerque: Sandia Laboratories, July 1972.

*Report SC-CR-72-3102.

Timimi, K. Al-. A survey of geometrical modelling systems. Peterborough, England: CAD CAM Publications, [1983?].

Tong, P., Mau, S.T., and Pian, T.H.H. Derivation of geometric stiffness and mass matrices for finite element hybrid models. International Jorunal of Solids and Structures, Vol. 10, 1974, pp. 919-932.

Wallace, Dolores R., and McKee, James M. The GPRIME approach to geometric modeling--Introduction to the language processor and finite element applications. Bethesda, Md.: David W. Taylor Naval Ship Research and Development Center, September 1982.

Yamada, Y. Nonlinear matrices in inelastic large deformation analysis and examples of their application. Tokyo: University of Tokyo, Institute of Industrial Science, [no date].

*Basic constitutive equations being used--simulation by generalized Voigt model of elastic plastic creep deformation.
*Hill's anisotropic material with elastic isotropy--development of elastic plastic analysis program EPIC-IV.
*Mises' isotropic material--incremental Prandtl-Reuss versus deformation Hencky theory of plasticity.
*Viscoelastic material--mechanical model versus equation of state approach.
*Geometrical nonlinearity--geometric stiffness matrix and its dependency on stress rate in constitutive relation.
*Load correction matrix and its role in large deformation analysis.
*FEMN--A compact nonlinear analysis program for microcomputer analysis.

END OF GEOMETRIC NONLINEARITIES BIBLIOGRAPHY

```
CCCCC  OOOOO  M   M
C      O   O  MM MM
C      O   O  M M M
C      O   O  M   M
CCCCC  OOOOO  M   M          COMPOSITES BIBLIOGRAPHY
```

Auld, B.A., Beaupre, G.S. and Herrmann, G. Horizontal shear surface waves on a laminated composite. SUDAM 78-3. Stanford: Stanford University, 1978. Reprinted in Miklowitz, J. and Acherbach, Jan D. Modern problems in elastic wave propagation. New York: John Wiley, 1978.

*ONR contract Nooo14-76-C-0054.

Batdorf, S.B., and Ghaffarian, R. Tensile strength of unidirectionally reinforced composites. Los Angeles: University of Califorria, 1981.

*ONR contract N00014-77-C-0505.

Beaupre, G., and Herrmann, G. Nondispersive wave propagation in a layered composite. Wave motion, Vol. 4, 1982.

Beaupre, G.S., and Herrman, G. Steady-state point source excitation of a laminated composite. SUDAM report 79-3. Stanford: Stanford University, 1979.

*ONR contract N00014-76-C-0054.

Becus, G.A., Dashner, P.A., and Kaul, R.K. Lie theory for a one dimensional laminated composite and the problem of homogenization. Report 102. Buffalo: State University of New York, 1978.

*ONR contract N00014-75-C-0302.

Bert, C.W. Classical analyses of laminated bimodulus composite material plates. Report OU-AMNE-79-10. Norman, Okla.: University of Oklahoma, July 1979.

*ONR contract N00014-78-C-0647.

Bert, C.W. Classical analyses of laminated bimodulus composite material plates. Report OU-AMNE-79-10A, revision superceeding OU-AMNE-79-10. Norman, Okla.: University of Oklahoma, August 1979.

*ONR contract N00014-78-C-0647.

Bert, Charles W. Mathematical modeling and micromechanics of fiber reinforced bimodulus composite materials. Report OU-AMNE-79-7. Norman, Okla.: University of Oklahoma, June 1979.

*ONR contract N00014-78-C-0647.

Bert, Charles W. Recent research in composite and sandwich plate dynamics. Report OU-AMNE-79-11. Norman, Okla.: University of Oklahoma, July 1979.

*ONR contract N00014-78-C-0647.

Bert, C.W. Research on dynamics of composite and sandwich plates, 1979-1981. Report OU-AMNE-82-3. Norman, Okla.: University of Oklahoma, 1982.

*ONR contract N00014-78-C-0647.

Bert, Charles W. Vibration of composite structures. Report OU-AMNE-80-6. Norman, Okla.: University of Oklahoma, March 1980.

*ONR contract N00014-78-C-0647.

Bert, C.W., et al. Analysis of thick rectangular plates laminated of bimodulus composite materials. Report OU-AMNE-80-2. Norman, Okla.: University of Oklahoma, January 1980.

*ONR contract N00014-78-C-0647.

Bert, C.W., et al. Vibration of thick rectangular plates of bimodulus composite material. Report OU-AMNE-80-8. Norman, Okla.: University of Oklahoma, May 1980.

*ONR contract N00014-78-C-0647.

Bert, C.W., Rebello, C.A., and Rebello, C.J. Analytical and experimental investigations of bimodular composite beams. Report OU-AMNE-82-2. Norman, Okla.: University of Oklahoma, 1982.

*ONR contract N00014-78-C-0647.

Bert, Charles W., and Reddy, V. Sudhakar. Cylindrical shells of bimodulus composite material. Report OU-AMNE-80-3. Norman, Okla.: University of Oklahoma, February 1980.

*ONR contract N00014-78-C-0647.

Conrad, Nicholas. On microcrack growth and arrest in simulated fibrous composites. College Station, Texas: Texas A & M, December 1976.

Demiray, H., and Eringen, A.C. Wave propagation in orthogonally reinforced fiber composites. Technical report no. 39; Civil engineering research report no. 76-SM-9. Princeton, N.J.: Princeton University, Department of Civil Engineering, June 1976.

*ONR contract N00014-76-C-0240.

Green, A.E., and Naghdi, P.M. A theory of laminated composite plates and rods. Report UCB/AM-81-3. Berkeley: University of California, May 1981.

*ONR contract N00014-75-C-0148.

Hashin, Zvi. Fatigue failure criteria for unidirectional fiber composites. Technical paper 5. Philadelphia: University of Pennsylvania, August 1980.

*ONR contract N00014-78-C-0544.

Herrmann, George, Beaupre, G.S., and Auld, B.A. Applicability of Floquet type solutions to bounded layered composites. SUDAM report 78-2. Stanford: Stanford University, February 1978; Mechanics Today, Vol. 5, 1980, pp. 83-92.

*ONR contract N00014-76-C-0054.

Herrmann, G., Delph, T.J., and Kaul, R.K. New results on continuum modelling of composites. Paper presented at the Symposium on continuum models of discrete systems, held in Mont Gabriel, Quebec, June-July 1977.

Herrmann, G., and Hemami, M. Plane strain surface waves in a laminated composite. SUDAM report 81-2. Stanford: Stanford University, May 1981. Reprint from Journal of Applied Mechanics, Vol. 49, December 1982, pp. 747-753.

*ONR contract N00014-76-C-0054.

Hsu, Y.S., Reddy, J.N., and Bert, C.W. Thermoelasticity of circular cylindrical shells laminated of bimodulus composite materials. Report OU-AMNE-80-14. Norman: University of Oklahoma, July 1980.

*ONR contract N00014-78-C-0647.

Jones, Robert M., and Morgan, Harold S. Buckling of stiff laminated composite circular shells with different moduli in tension and compression: preliminary results. Dallas: Southern Methodist University, Institute of Technology, November 1971.

*ONR contract N00014-72-A-0296-0002.

Juneau, P.W., Jr., Shenker, L.H., and Saffire, V.N. Optimization of a boron filament reinforced composite matrix. Mimeograph. [no publication data]

Levy, A., Armen, H., Jr., and Whiteside, J. Elastic and plastic interlaminar deformation in laminated composites under generalized plane stress. Bethpage, N.Y.: Grumman Aerospace Corporation, [no date].

Mathers, M. Shear flexible, fibrous composite plate and shell elements. [no publication]

*includes slide reproductions only.

Mitchell, Richard A., Woolley, Ruth M., and Chwirut, Daniel J. Analysis of composite reinforced cutouts and cracks. AIAA paper 74-377. AIAA/ASME/SAE 15th Structures, structural dynamics and materials conference, held in Las Vegas, April 1974.

Mukherjee, Subrata, and Lee, E.H. Dispersion relations and mode shapes for waves in laminated viscoelatsic composites by variational methods. SUDAM-76-4. Stanford: Stanford University, October 1976.

*ONR contract N00014-75-C-0698, final report.

Patil, S.S., Rao, A.K., and Raju, I.S. Special finite elements for flaw and discontinuity stresses in composites. Bangalore: Indian Institute of Science, [no date].

Reddy, J.N. Analysis of layered composite plates accounting for large deflections and transverse shear strains. Paper prepared for Hinton, E., Taylor, C., and Owen, D.R.J., editors. Recent advances in nonlinear computational mechanics. Swansea: Pine Ridge Press, [no date]; Blacksburg, Vir.: Virginia Polytechnic Institute, April 1981.

Reddy, J.N. Finite element analyses of laminated composite material plates. Norman, Okla.: University of Oklahoma, June 1979.

*OU-AMNE-79-9.
*ONR contract N00014-78-C-0647.

Reddy, J.N. Transient response of laminated, bimodular-material composite rectangular plates. Blacksburg, Vir.: Virginia Polytechnic Institute, November 1981.

*ONR contract N00014-78-C-0647.

Reddy, J.N., et al. Thermal bending of thick rectangular plates of bimodulus composite materials. Norman, Okla.: University of Oklahoma, June 1980.

*Report OU-AMNE-80-9.
*ONR contract N00014-78-C-0647.

Reddy, J.N., and Bert, C.W. On the behavior of plates laminated of bimodulus composite materials. Blacksburg, Vir.: Virginia Polytechnic Institute, April 1981.

*ONR contract N00014-78-C-0647.

Reddy, J.N., and Chao, W.C. Finite element analysis of laminated bimodulous composite material plates. Norman, Okla: University of Oklahoma, August 1979.

*OU-AMNE-79-18.
*ONR contract N00014-78-C-0647.

Reddy, J.N., and Chao, W.C. Large deflection and large amplitude free vibrations of laminated composite material plates. Norman, Okla.: University of Oklahoma, April 1980.

*OU-AMNE-80-7.
*ONR contract N00014-78-C-0647.

Reddy, J.N., and Hsu, Y.S. Effects of shear deformation and anisotropy on the thermal bending of layered composite plates. Norman, Okla.: University of Oklahoma, December 1979.

*OU-AMNE-79-20.
*ONR contract N00014-78-C-0647.

Reddy, V. Sudhakar, and Bert, Charles W. Analyses of cross ply rectangular plates of bimodulus composite material. Norman, Okla.: University of Oklahoma, School of Aerospace, Mechanical and Nuclear Engineering, January 1980.

*Report OU-AMNE-80-1.
*ONR contract N00014-78-C-0647.

Rose, Joseph L., Jeong, Yi H., and Avioli, Micheal J. Utility of a probability density function curve and F-maps in composite material inspection. Portions of this paper presented at the Spring meeting of the Society for Nondestructive Testing, held in Philadelphia, March 1980.

BEST COPY

Schapery, R.A. Deformation and failure analysis of viscoelastic composite materials. Chapter Five from, Schapery, R.A. Inelastic behavior of composite materials. Paper presented at 1975 ASME Winter Annual Meeting, held in Houston, Texas, November-December 1975.

*ASME publication AMD-Vol. 31.
*ONR contract N00014-75-C-0325.

Sharifi, P. Nonlinear buckling analysis of composite shells. AIAA/ ASME/SAE 15th Structures, structural dynamics and materials conference, held in Las Vegas, April 1974.

*AIAA Paper 74-411.

Sih, G.C. Impact stress intensity factors in composites. Paper presented at the NASA-LaRC-University Engine structures research in-progress workshop, held in Cleveland, Ohio, at the Lewis Research Center, October 1980; Bethlehem, Penna.: Lehigh University, Institute of Fracture and Solid Mechanics, 1980.

Sinha, P.K. Failure of composites. Structural inelasticity 20. Minneapolis, MN: University of Minnesota, Department of Aerospace Engineering and Mechanics, January 1978.

*Report AEM-H1-20.
*ONR contract N00014-75-C-0177.
*KW: fracture, plastic flow.

Smith, M.K., Hart-Smith, L.J., and Dietz, C.G. Interactive composite joint design. Wright-Patterson AFB: Air Force Flight Dynamics Laboratory, April 1978.

*AFFDL-TR-78-38-Part I.

Stanton, Edward L. A general three dimensional computational model for nonlinear composite structures and materials. Santa Ana, Calif.: Prototype development Associates, June 1977.

*ONR contract N00014-76-C-0161.

Sutton, W.H., editor. Review of research on composite materials. Paper presented to the 15th refractory composites working group, held in Los Angeles, in February 1969; King of Prussia, PN: general Electric Co., MSD, Space Sciences Laboratory, 1969.

Swami, R.N. Seminar on laminar composite materials analysis and nonlinear analysis using MSC/NASTRAN. Prepared for the Martin-Marietta Corporation, Orlando, Florida, October 1972.

Triplett, J.R., and Gurtman, G.A. A study of composite material damage induced by laser supported detonation waves. La Jolla, CA: Systems, Science and Software, September 1976.

*ONR contract N00014-75-C-0993.
*KW: ductile fracture, wave propagation.

Unal, Aynur, and Herrmann, George. On the effect of bonding in a laminated composite. Stanford: Stanford University, May 1975.

*SUDAM Report 75-2.
*ONR contract N00014-67-A-0112-0065.
*AFOSR Grant 74-2669.

Viswanathan, A.V., and Soong, Tsai-Chen, and Miller, R.E., Jr. Buckling analysis for structural sections and stiffened plates reinforced with laminated composites. International Jorunal of Solids and Structures, Vol. 8, 1972, pp. 347-367.

Wang, Tsun Kuei, and Yuan, Yuan. A new hybrid stress element for multilayer laminates. Journal of Reinforces Plastics and Composites, Vol. 1, April 1982, pp. 124-130.

Weitsman, Y. Stresses in adhesive joints due to moisture and temperature. Reprint from the Journal of Composite Materials, Vol. 11, October 1977, pp. 378-394.

Triplett, J.R., and Gurtman, G.A. A study of composite material damage induced by laser supported detonation waves. La Jolla, CA: Systems, Science and Software, September 1976.

*ONR contract N00014-75-C-0993.
*KW: ductile fracture, wave propagation.

Unal, Aynur, and Herrmann, George. On the effect of bonding in a laminated composite. Stanford: Stanford University, May 1975.

*SUDAM Report 75-2.
*ONR contract N00014-67-A-0112-0065.
*AFOSR Grant 74-2669.

Viswanathan, A.V., and Soong, Tsai-Chen, and Miller, R.E., Jr. Buckling analysis for structural sections and stiffened plates reinforced with laminated composites. International Jorunal of Solids and Structures, Vol. 8, 1972, pp. 347-367.

Wang, Tsun Kuei, and Yuan, Yuan. A new hybrid stress element for multilayer laminates. Journal of Reinforces Plastics and Composites, Vol. 1, April 1982, pp. 124-130.

Weitsman, Y. Stresses in adhesive joints due to moisture and temperature. Reprint from the Journal of Composite Materials, Vol. 11, October 1977, pp. 378-394.

Willis, J.R. Elasticity theory of composites. Stanford: Stanford University, March 1980.

*SUDAM report 80-2.
*ONR contract N00014-76-C-0054.

Yamada, Yoshiaki. Constitutive modeling of inelastic behavior and numerical solution of nonlinear problems by the finite element method. Computers and Structures, Vol. 8, 1978, pp. 533-543.

*describes the general purpose nonlinear continuum mechanics program COMPOSITE-III.

BEST COPY AVAILABLE

Yamada, Y., and Okumura, H. Finite element analysis of stress and strain in inhomogeneous media or composite materials. Paper presented at the Conference on hybrid and mixed methods, held in Atlanta, GA, in April 1981; Tokyo: University of Tokyo, Institute of Industrial Science, 1981.

COMPOSITES BIBLIOGRAPHY ENDS

The facility for the creation of bibliographies such as this will soon be available in a public area and a help note and documentation will also be available. I would request that any bibliography that is generated from the files that will be made available have a copy deposited in the IGEL collection for other users.

Thanks.

P.S.--If there is anyone with a special interest in a specific journal received by the IGEL Library or in any particular subject, just mention it to me and I will tell you the day on which we receive a copy.

END

BEST COPY AVAILABLE

Increasing special library collection use in very computer intensive environments: Automatic bibliographies compilation and the dissemination of electronic newsletters.

Addendum: Source code listing of single descriptor search facility.

```
      logical ieof
      integer ifile(16),ofile(16)
      integer str(20),linbuf(40,20),line(40)
      integer biga,smalla,smallz
      data biga,smalla,smallz/"<000>A","<000>a","<000>z"/

      write (10,10002)
10002 format ("Output file: ",Z)
      read (11,11001) ofile(1)
      open 6,ofile,att="SO"

      write (10,10003)
10003 format ("Search string: ",Z)
      read (11,11001) str(1)
      len = length(str)
      do 3 i=1,len
       byte(str,i) = iand(byte(str,i),127)
       if (byte(str,i) .ge. smalla .and. byte(str,i) .le. smallz)
     +       byte(str,i) = byte(str,i) - smalla + biga
3     continue

      write (6,6001) str(1)
6001  format ("I.G.E.L.  Library"//
     +        "Select bibliography on ",S40/
     +        79(1H-)//)

5     write (10,10001)
10001 format ("Input file:  ",Z)
      read (11,11001,end=9999) ifile(1)
11001 format (S31)
      if (byte(ifile,1) .eq. 0) goto 9999
      open 5,ifile,att="SIB",err=5

      write (10,10006)
10006 format ("Enter subheading (RETURN if none): ",Z)
      read (11,11002) line(1)
11002 format (S79)
      if (byte(line,1) .ne. 0) write(6,6002) line(1)
6002  format (/S79/79(1H-)//)

      imatch = 0
      read (5,5001) line
5001  format (40A2)

      ieof = .false.
10    iptr = 1
15    call strcpy(line,1,linbuf(1,iptr),1,80,.false.,.false.)
      read (5,5001,end=99) line
      if (byte(line,1) .ne. 32) goto 20
       iptr = iptr + 1
       goto 15

99    ieof = .true.
20    continue


      do 40 i=1,iptr
       ilast = 81-len
       do 50 j=1,ilast
        do 60 k=1,len
         ic = iand(byte(linbuf(1,i),j+k-1),127)
         if (ic .ge. smalla .and. ic .le. smallz) ic = ic - smalla + biga
         if (ic .ne. byte(str,k)) goto 50
60       continue
```

SEARCH.FR
SINGLE DESCRIPTOR
PAGE 1 OF 2

BEST COPY

SEARCH.FR
SINGLE DESCRIPTOR
PAGE 2 of 2

```
            goto 70
50          continue
40          continue
            if (.not. ieof) goto 10
            goto 999

70          imatch = imatch + 1
            do 80 i=1,iptr
             write (6,5001) (linbuf(j,i),j=1,40)
80          continue
            if (.not. ieof) goto 10

999         continue
            close 5
            write (10,10005) imatch
10005       format (I5," Entries matched.")
            goto 5

9999        end
```

SEARCH.FR
SINGLE DESCRIPTOR
FORTRAN 5

INCLUDES SUBROUTINES

STRCPY.FR
LENGTH.FR

[FTN 5 W/O CHANGE]

BEST COPY